

Appl. No. 10/691,758
Response to 10/06/06 Final Office Action (RCE)
Atty. Dkt. 12872-E (BA4-200)

In the Claims:

Claims 1-59 [cancelled].

60. [New] A process control monitoring system comprising:

a plurality of radio frequency identification devices associated with respective ones of a plurality of process control elements of an industrial plant;

an interrogator configured to implement wireless communications with respect to the radio frequency identification devices, wherein the interrogator is configured to output a plurality of wireless interrogation signals which identify the radio frequency identification devices; and

wherein the radio frequency identification devices are individually configured to receive the wireless interrogation signals, and for individual ones of the wireless interrogation signals, to determine whether the individual wireless interrogation signal identifies the individual one of the radio frequency identification devices and to output a wireless reply signal comprising information of the respective one of the process control elements responsive to the individual wireless interrogation signal identifying the individual one of the radio frequency identification devices.

61. [New] The system of claim 60 wherein the radio frequency identification devices are configured to monitor operations of the respective process control elements, and the information of the wireless reply signal comprises information regarding the operations of the respective one of the process control elements.

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62. [New] The system of claim 61 wherein the information comprises information regarding a status of the respective one of the process control elements.

63. [New] The system of claim 60 wherein the interrogator comprises a control tag configured to receive the wireless reply signal comprising the information, and further comprising a reader configured to implement wireless communications with respect to the control tag to obtain the information from the control tag.

64. [New] The system of claim 60 wherein the wireless interrogation signals individually identify a plurality of the radio frequency identification devices.

65. [New] The system of claim 60 wherein the radio frequency identification devices comprise respective identifiers and the wireless interrogation signals identify the radio frequency identification devices using the identifiers.

66. [New] The system of claim 65 wherein the respective radio frequency identification device is configured to output the wireless reply signal responsive to an identifier of at least one of the wireless interrogation signals matching the identifier of the respective radio frequency identification device.

67. [New] The system of claim 65 wherein the identifiers comprise unique identifiers of respective ones of the radio frequency identification devices, and wherein the respective of the radio frequency identification device is configured to output the wireless

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reply signal responsive to an identifier of at least one of the wireless interrogation signals matching the unique identifier of the respective radio frequency identification device.

68. [New] The system of claim 60 wherein the interrogator is configured to use the information to perform operations with respect to prognostics of the process control element.

69. [New] The system of claim 60 wherein the interrogator is configured to use the information to estimate a remaining useful life of the process control element.

70. [New] A process control monitoring system comprising:
a plurality of radio frequency identification devices configured to monitor operations of respective ones of a plurality of process control elements of an industrial plant and to store information regarding the operations of the respective process control elements responsive to the monitoring;

a control tag configured to implement first wireless communications with the radio frequency identification devices and to receive the information regarding the operations of the process control elements from the radio frequency identification devices via the first wireless communications; and

a reader configured to implement second wireless communications with the control tag and to receive the information regarding the operations of the process control elements from the control tag via the second wireless communications.

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71. [New] The system of claim 70 wherein the control tag is configured to output a wireless interrogation signal which identifies at least one of the radio frequency identification devices, and the at least one of the radio frequency identification devices is configured to output a wireless reply signal which comprises the information regarding the operations of a respective one of the process control elements responsive to the identifying.

72. [New] The system of claim 70 wherein the reader is configured to output a wireless interrogation signal which identifies the control tag, and the control tag is configured to output a wireless reply signal which comprises the information regarding the operations of the process control elements responsive to the identifying.

73. [New] An industrial plant comprising:
a plurality of zones individually comprising:
a plurality of process control elements of the industrial plant;
a plurality of radio frequency identification devices configured to obtain information regarding respective ones of the process control elements; and
a control tag configured to first wirelessly interrogate the radio frequency identification devices of the respective zone, and wherein the radio frequency identification devices of the respective zone are configured to wirelessly communicate the information to the control tag responsive to the first wireless interrogation; and
a reader configured to second wirelessly interrogate individual ones of the control tags of the zones, and wherein the control tags are individually configured to wirelessly communicate the information to the reader responsive to the second wireless interrogation.

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74. [New] The plant of claim 73 wherein the radio frequency identification devices are configured to obtain the information comprising status information regarding the process control elements.

75. [New] A process control monitoring method comprising:
using a radio frequency identification device, monitoring operations of a process control element of an industrial plant;
storing information regarding the operations of the process control element using the radio frequency identification device after the monitoring;
receiving a wireless interrogation signal within the radio frequency identification device from an interrogator; and
responsive to the receiving the wireless interrogation signal, outputting a wireless reply signal using the radio frequency identification device for communication to the interrogator, wherein the wireless reply signal comprises the information regarding the operations of the process control element.

76. [New] The method of claim 75 further comprising comparing an identifier of the wireless interrogation signal with an identifier of the radio frequency identification device and wherein the outputting comprises outputting responsive to the identifier of the wireless interrogation signal matching the identifier of the radio frequency identification device.

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77. [New] The method of claim 76 wherein the comparing comprises comparing the identifier of the wireless interrogation signal with the identifier of the radio frequency identification device which uniquely identifies the radio frequency identification device.

78. [New] The method of claim 75 wherein the storing comprises storing the information comprising status of the process control element.

79. [New] The method of claim 75 further comprising:
outputting the wireless interrogation signal using the interrogator comprising a control tag; and
receiving the wireless reply signal using the control tag.

80. [New] The method of claim 79 wherein the wireless interrogation signal comprises a first wireless interrogation signal, the wireless reply signal comprises a first wireless reply signal, and further comprising:

receiving a second wireless interrogation signal within the control tag from a reader;
and

outputting a second wireless reply signal comprising the information for communication to the reader.

81. [New] The method of claim 80 further comprising:
outputting the second wireless interrogation signal using the reader; and
receiving the second wireless reply signal using the reader.

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82. [New] The method of claim 80 further comprising comparing an identifier of the second wireless interrogation signal with an identifier of the control tag, and wherein the outputting the second wireless reply signal comprises outputting responsive to the identifier of the second wireless interrogation signal matching the identifier of the control tag.

83. [New] A process control monitoring method comprising:

first outputting a first wireless interrogation signal using a control tag;

first receiving the first wireless interrogation signal using a radio frequency identification device which is associated with a process control element of an industrial plant;

second outputting a first wireless reply signal comprising information regarding operations of the process control element using the radio frequency identification device responsive to the first receiving;

second receiving the first wireless reply signal using the control tag;

third outputting a second wireless interrogation signal using a reader;

third receiving the second wireless interrogation signal using the control tag;

fourth outputting a second wireless reply signal comprising the information regarding the operations of the process control element using the control tag responsive to the third receiving; and

fourth receiving the second wireless reply signal using the reader.

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84. [New] The method of claim 83 further comprising, using the radio frequency identification device, monitoring the operations of the process control element and storing the information responsive to the monitoring.

85. [New] The method of claim 83 wherein the second outputting comprises outputting responsive to the first wireless interrogation signal identifying the radio frequency identification device.

86. [New] The method of claim 85 wherein the fourth outputting comprises outputting responsive to the second wireless interrogation signal identifying the control tag.

87. [New] The method of claim 83 wherein the fourth outputting comprises outputting responsive to the second wireless interrogation signal identifying the control tag.

88. [New] The method of claim 83 further comprising, using the reader, performing operations with respect to prognostics of the process control element using the information.

89. [New] The method of claim 83 further comprising, using the reader, estimating a remaining useful life of the process control element using the information.